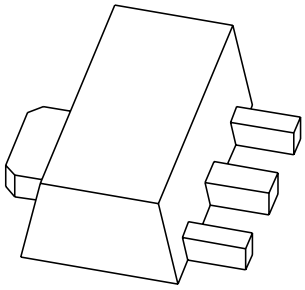
查询PBSS4250X供应商



# DATA SHEET



# PBSS4250X
## 50 V, 2 A
## NPN low $V_{CEsat}$ (BISS) transistor

Product specification
Supersedes data of 2003 Jun 17

2004 Nov 08

Philips
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# 50 V, 2 A NPN low $V_{CEsat}$ (BISS) transistor

# PBSS4250X

## FEATURES

- SOT89 (SC-62) package
- Low collector-emitter saturation voltage $V_{CEsat}$
- High collector current capability: $I_C$ and $I_{CM}$
- Higher efficiency leading to less heat generation
- Reduced printed-circuit board requirements.

## APPLICATIONS

- Power management
  - DC/DC converters
  - Supply line switching
  - Battery charger
  - LCD backlighting.
- Peripheral drivers
  - Driver in low supply voltage applications (e.g. lamps and LEDs).
  - Inductive load driver (e.g. relays, buzzers and motors).

## DESCRIPTION

NPN low $V_{CEsat}$ transistor in a SOT89 plastic package.
PNP complement: PBSS5250X.

## MARKING

| TYPE NUMBER | MARKING CODE(1) |
|---|---|
| PBSS5250X | *1M |

**Note**

1. * = p: Made in Hong Kong
   * = t: Made in Malaysia
   * = W: Made in China.

## QUICK REFERENCE DATA

| SYMBOL | PARAMETER | MAX. | UNIT |
|---|---|---|---|
| $V_{CEO}$ | collector-emitter voltage | 50 | V |
| $I_C$ | collector current (DC) | 2 | A |
| $I_{CM}$ | peak collector current | 5 | A |
| $R_{CEsat}$ | equivalent on-resistance | 160 | mΩ |

## PINNING

| PIN | DESCRIPTION |
|---|---|
| 1 | emitter |
| 2 | collector |
| 3 | base |

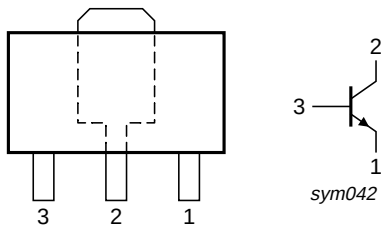



Fig.1 Simplified outline (SOT89) and symbol.

## ORDERING INFORMATION

| TYPE NUMBER | PACKAGE | | |
|---|---|---|---|
| | NAME | DESCRIPTION | VERSION |
| PBSS4250X | SC-62 | plastic surface mounted package; collector pad for good heat transfer; 3 leads | SOT89 |

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| $V_{CBO}$ | collector-base voltage | open emitter | – | 50 | V |
| $V_{CEO}$ | collector-emitter voltage | open base | – | 50 | V |
| $V_{EBO}$ | emitter-base voltage | open collector | – | 5 | V |
| $I_C$ | collector current (DC) | | – | 2 | A |
| $I_{CM}$ | peak collector current | limited by $T_{j(max)}$ | – | 5 | A |
| $I_B$ | base current (DC) | | – | 0.5 | A |
| $P_{tot}$ | total power dissipation | $T_{amb} \leq 25$ °C | | | |
| | | note 1 | – | 550 | mW |
| | | note 2 | – | 1 | W |
| $T_{stg}$ | storage temperature | | –65 | +150 | °C |
| $T_j$ | junction temperature | | – | 150 | °C |
| $T_{amb}$ | ambient temperature | | –65 | +150 | °C |

**Notes**

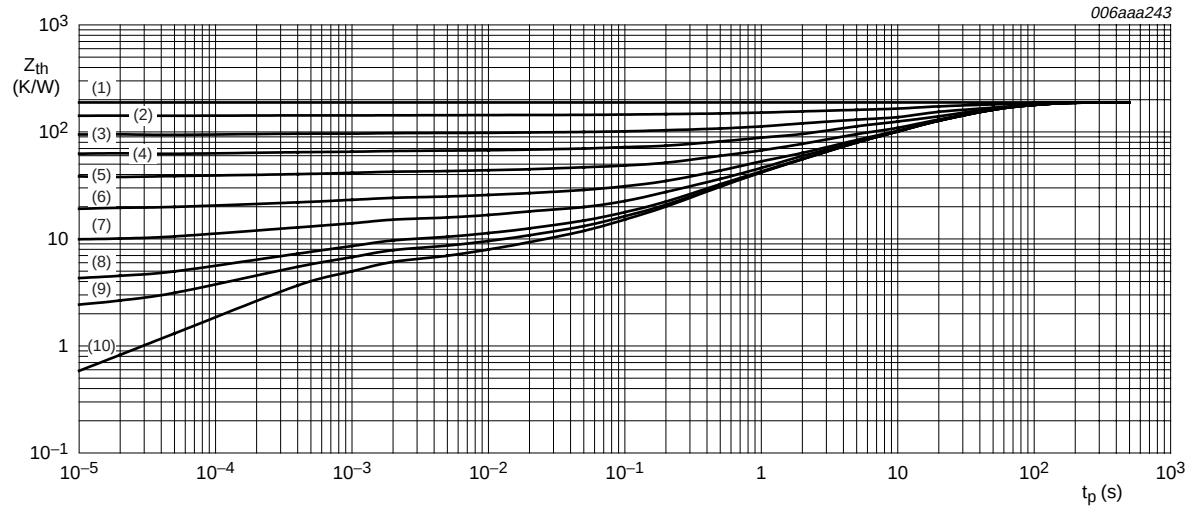
1. Device mounted on a FR4 printed-circuit board; single-sided copper; tin-plated; standard footprint.
2. Device mounted on a FR4 printed-circuit board; single-sided copper; tin-plated; mounting pad for collector 1 $cm^2$.

## THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---|---|---|---|---|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air | | |
| | | note 1 | 225 | K/W |
| | | note 2 | 125 | K/W |
| | | note 3 | 90 | K/W |
| | | note 4 | 80 | K/W |
| $R_{th(j-s)}$ | thermal resistance from junction to soldering point | | 16 | K/W |

**Notes**

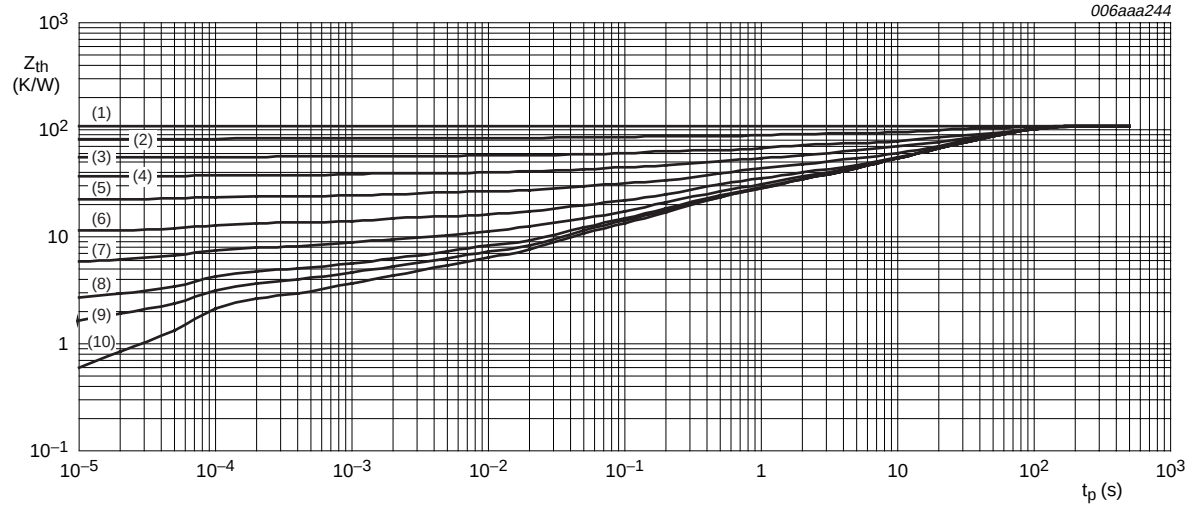
1. Device mounted on a FR4 printed-circuit board; single-sided copper; tin-plated; standard footprint.
2. Device mounted on a FR4 printed-circuit board; single-sided copper; tin-plated; mounting pad for collector 1 $cm^2$.
3. Device mounted on a FR4 printed-circuit board; single-sided copper; tin-plated; mounting pad for collector 6 $cm^2$.
4. Device mounted on a ceramic printed-circuit board 7 $cm^2$, single-sided copper, tin-plated.




Mounted on FR4 printed-circuit board; standard footprint.

(1) δ = 1. (3) δ = 0.5. (5) δ = 0.2. (7) δ = 0.05. (9) δ = 0.01.
(2) δ = 0.75. (4) δ = 0.33. (6) δ = 0.1. (8) δ = 0.02. (10) δ = 0.

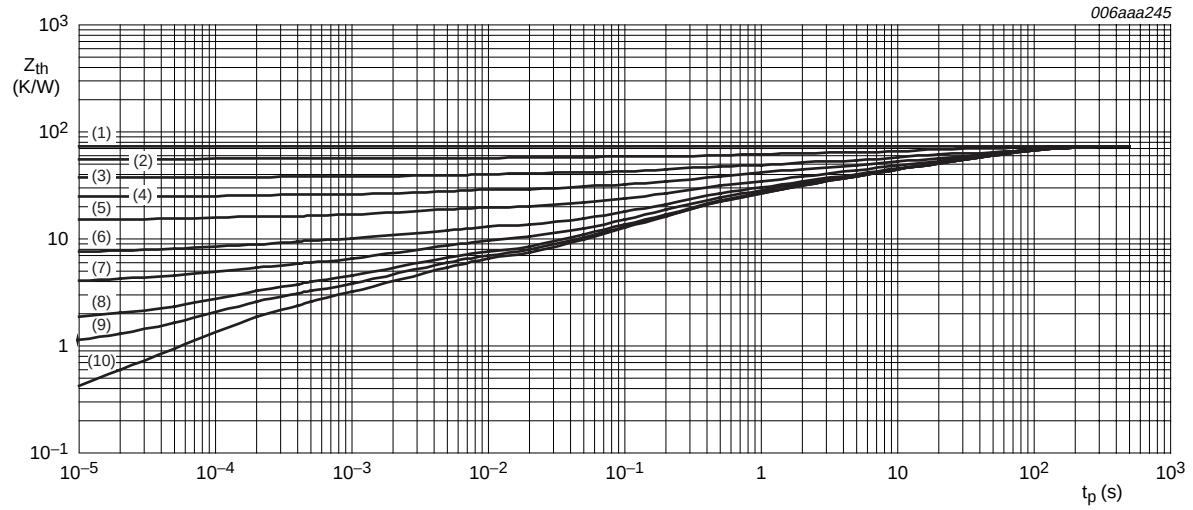
Fig.2 Transient thermal impedance as a function of pulse time; typical values.




Mounted on FR4 printed-circuit board; mounting pad for collector 1 $cm^2$.

(1) δ = 1. (3) δ = 0.5. (5) δ = 0.2. (7) δ = 0.05. (9) δ = 0.01.
(2) δ = 0.75. (4) δ = 0.33. (6) δ = 0.1. (8) δ = 0.02. (10) δ = 0.

Fig.3 Transient thermal impedance as a function of pulse time; typical values.




Mounted on FR4 printed-circuit board; mounting pad for collector 6 $cm^2$.

(1) δ = 1. (3) δ = 0.5. (5) δ = 0.2. (7) δ = 0.05. (9) δ = 0.01.
(2) δ = 0.75. (4) δ = 0.33. (6) δ = 0.1. (8) δ = 0.02. (10) δ = 0.

Fig.4 Transient thermal impedance as a function of pulse time; typical values.

## CHARACTERISTICS

$T_{amb}$ = 25 °C unless otherwise specified.

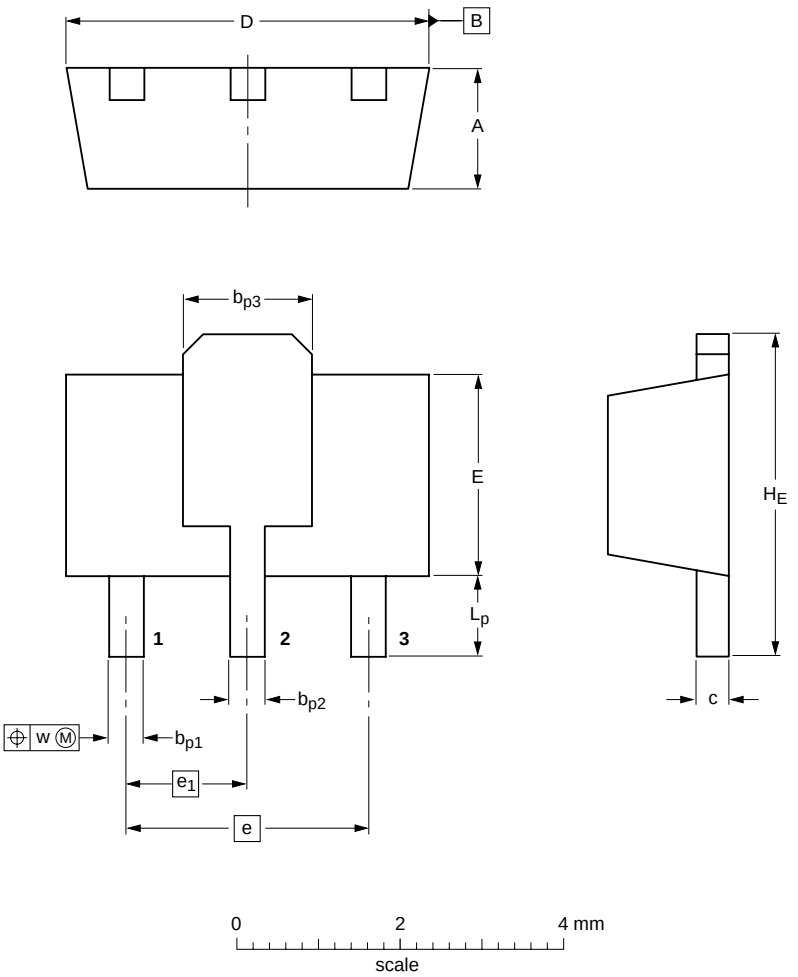
| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| $I_{CBO}$ | collector-base cut-off current | $V_{CB}$ = 50 V; $I_E$ = 0 A | – | 100 | nA |
| | | $V_{CB}$ = 50 V; $I_E$ = 0 A; $T_j$ = 150 °C | – | 50 | μA |
| $I_{CES}$ | collector-emitter cut-off current | $V_{CE}$ = 50 V; $V_{BE}$ = 0 V | – | 100 | nA |
| $I_{EBO}$ | emitter-base cut-off current | $V_{EB}$ = 5 V; $I_C$ = 0 A | – | 100 | nA |
| $h_{FE}$ | DC current gain | $V_{CE}$ = 2 V | | | |
| | | $I_C$ = 0.1 A | 300 | – | |
| | | $I_C$ = 0.5 A | 300 | – | |
| | | $I_C$ = 1 A; note 1 | 300 | – | |
| | | $I_C$ = 2 A; note 1 | 150 | – | |
| $V_{CEsat}$ | collector-emitter saturation voltage | $I_C$ = 0.5 A; $I_B$ = 50 mA | – | 90 | mV |
| | | $I_C$ = 1 A; $I_B$ = 50 mA | – | 250 | mV |
| | | $I_C$ = 2 A; $I_B$ = 100 mA | – | 380 | mV |
| | | $I_C$ = 2 A; $I_B$ = 200 mA; note 1 | – | 320 | mV |
| $R_{CEsat}$ | equivalent on-resistance | $I_C$ = 2 A; $I_B$ = 200 mA; note 1 | – | 160 | mΩ |
| $V_{BEsat}$ | base-emitter saturation voltage | $I_C$ = 2 A; $I_B$ = 100 mA | – | 1.1 | V |
| $V_{BEon}$ | base-emitter turn-on voltage | $V_{CE}$ = 2 V; $I_C$ = 1 A | 1.1 | – | V |
| $f_T$ | transition frequency | $I_C$ = 100 mA; $V_{CE}$ = 5 V; f = 100 MHz | 100 | – | MHz |
| $C_c$ | collector capacitance | $V_{CB}$ = 10 V; $I_E$ = $i_e$ = 0 A; f = 1 MHz | – | 25 | pF |

**Note**

1. Pulse test: $t_p \leq 300$ μs; $\delta \leq 0.02$.

## PACKAGE OUTLINE

**Plastic surface mounted package; collector pad for good heat transfer; 3 leads** **SOT89**




**DIMENSIONS (mm are the original dimensions)**

| UNIT | A | $b_{p1}$ | $b_{p2}$ | $b_{p3}$ | c | D | E | e | $e_1$ | $H_E$ | $L_p$ | w |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 1.6<br>1.4 | 0.48<br>0.35 | 0.53<br>0.40 | 1.8<br>1.4 | 0.44<br>0.23 | 4.6<br>4.4 | 2.6<br>2.4 | 3.0 | 1.5 | 4.25<br>3.75 | 1.2<br>0.8 | 0.13 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT89 | | TO-243 | SC-62 | | | ~~99-09-13~~<br>04-08-03 |

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